Nutrient Reduction Programs and Their Impact on Credit Analysis

by Eva D. Rippeteau

Municipal water and sewer utilities are fee-based long-term enduring monopolies that provide highly essential services to the general public. Provision of these services is generally carried out by local governmental entities which are, in turn, heavily regulated by state and federal environmental and public health agencies with primary oversight conducted by the federal United States Environmental Protection Agency (USEPA). The total maximum daily load (TMDL) component of the USEPA’s Clean Water Act of 1972 (amended in 1977, 1981 and 1987) specifies the allowable pollutant loading from contributing sources and assigns numerical limits to the permissible concentrations of nutrient discharges. Nutrient reduction programs address concentrated volumes of naturally occurring nutrients that enter natural waterways and water bodies from various manmade municipal and rural sources and cause ecological harm.

Figure 1. Eutrophication and Its Impact on Natural Water Bodies

Excess concentrations of nitrogen and phosphorus in water cause eutrophication – a process shown in this diagram. Source: BBC Bitesize, Eutrophication, 2008.

As demonstrated in Figure 1, and according to the USEPA, “pollutants often enter upstream waters like creeks and streams and then flow into larger water bodies like lakes, rivers and bays. Excess nitrogen and phosphorus can travel thousands of miles to coastal areas where the effects of the pollution are felt in the form of massive dead zones, such as those in the Gulf of Mexico and Chesapeake Bay. More than 100,000 miles of rivers and streams, close to 2.5 million acres of lakes, reservoirs and ponds, and more than 800 square miles of bays and estuaries in the United States have poor water quality because of nitrogen and phosphorus pollution.”

An assessment of nutrients and regulations, including Fitch Ratings’ (Fitch) overview of water and sewer utilities as they face regulatory mandates to address nutrient loading, follows. The credit quality of two Fitch-rated utilities under consent orders for nutrient reduction is also explored.

What are Nutrients and How Do They Affect the Environment?

Nutrients are naturally occurring elements that exist in the air we breathe, the water we drink, and the soil we till and on which we walk. Specifically, nitrogen and phosphorus are two very common nutrients relevant to the treatment and protection of water and wastewater. When in perfect balance, nitrogen and phosphorus are critical components of healthy ecosystems; however, when a high concentration of either nutrient exists in natural water bodies, the aquatic ecosystem becomes impaired. The most likely result of overloading of nutrients is the process of eutrophication, which is the formation of algal (algae) blooms. These blooms grow, spread and consume much of the water’s dissolved oxygen, leading to hypoxia. The blooms shade the benthic (bottom) zone of a sea bed, blocking off vital sunlight needed for photosynthesis.

According to the USEPA, the sometimes toxic nature of algal blooms can lead to illnesses and death in fish, and can even be harmful to humans. Further, the USEPA indicates there are significant monetary costs associated with poor water quality as a result of nutrient loading. The smells and appearance of algal blooms may decrease the value of waterfront homes and detract tourism; fish stocks may diminish and negatively impact the fishing industry; and the high costs of completing mandated capital programs and paying back associated debt burdens compels utilities to increase customer charges.

Concentrated nutrients enter natural water bodies in a variety of ways. The most readily measurable way is from wastewater treatment plant (WWTP) effluent. Wastewater is full of nitrogen from human waste, street runoff, industrial chemicals, and more. The resulting effluent product, unless otherwise treated, and after controlling for pathogens, bacterial and solid material, contains the bulk of this nitrogen. Another common municipal source of nutrients is the overflow of combined storm and sanitary sewers during periods of high precipitation into natural water bodies. These combined sewer overflows (CSOs) are combinations of street runoff and untreated sanitary flows that would otherwise flow toward a WWTP. Sanitary sewer overflows (SSOs) occur when the sanitary sewer becomes overwhelmed and spills a high concentration of untreated sewage into streets or waterways. The SSOs often point to greater infrastructural deficiencies as sanitary sewers are strictly meant to convey untreated sanitary flows and should not be affected by changes in precipitation.

The USEPA indicates that the largest contributor of nutrients to natural water bodies is from agricultural sources. Heavy concentrations of nitrogen and phosphorus found in farm animal waste and agricultural pesticides, respectively, are extremely harmful when they runoff or are discharged into natural water bodies. Other sources include: contaminated municipal stormwater runoff; airborne nitrogen particles from the burning of fossil fuels at coal-powered electric plants; industrial, commercial and transportation emissions; and the residential use of chemicals and fertilizers around the house.

Nutrient Reduction’s Regulatory Framework

The USEPA’s National Pollution Discharge Elimination (NPDES)
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Challenges that face natural water systems – this impaired water body showing ducks maneuvering through the algal blooms – can result from an over-accumulation of nutrients.

permits are issued to industrial, municipal and other wastewater treatment facilities and dictate the TMDLs for water bodies based on their flushing and dilutive propensities. Most states, through their respective environmental protection agencies, are authorized by Section 303(d)(1)(C) of the CWA to identify water bodies that do not meet CWA water quality standards. States must prove that their TMDL requirements are sufficiently stringent to comply with the goals of the CWA, and then monitor the compliance activity of NPDES permit holders.

A number of utilities and cities across the country are facing mandated programs and consent orders from state environmental agencies and the USEPA to address persistent nutrient overloading violations and to reduce their nitrogen output. The utility or city will work closely with the regulator and a judge to agree on a program that specifically addresses local contextual needs and best practices to reduce nutrients from entering waterways. A common nutrient reduction approach is the mitigation of CSO and SSO occurrences which are very prevalent in older, larger cities that have very old (and possibly clogged) combined storm and sanitary sewer systems that overflow during extreme wet weather. Since the early 2000s, the USEPA has engaged the cities of New York City, Boston, Philadelphia and Washington, DC (to name a few) in mandated CSO reduction programs, and is progressively targeting smaller-sized cities that are also consistently polluting waterways.

Evaluating Impacts of Nutrient Reduction Programs for Credit Rating

Fitch Ratings (Fitch) is a credit rating agency that assigns ratings to entities that issue debt to fund capital programs, in some cases initiated by regulatory action. Fitch’s methodology for assessing the credit quality – or the ability for an entity to repay its debts to investors (outlined in the Table on next page) – hinges on a multi-faceted assessment of that entity, including its compliance with relevant regulatory standards. The key attributes on which Fitch relies in order to assign long-term bond ratings and succinctly describe the
Consent order mandates have been a dominant factor for sector credits since passage of the federal CWA and SDWA (Safe Drinking Water Act), and the costs of implementing mandated programs can be tremendous. In many cases, the scope of these programs extends beyond the purview of a utility’s standard capital improvement plan (CIP) and the added costs may necessitate additional leveraging (borrowing). Fitch has found that the greater extent to which a utility proactively stays ahead of anticipated state and federal requirements, the greater the utility can minimize its costs and more effectively plan and implement regulatory requirements, ultimately reducing credit risk.

Fitch’s 2014 water and sewer sector outlook\(^3\) cautions that the near term to maintain regulatory compliance.\(^2\)

Fitch Ratings evaluates these four key qualitative and quantitative criteria points to assess a borrower’s expected ability to meet financial debt repayment obligations in full and on schedule. The degree to which certain credit factors are emphasized—especially nonfinancial factors—will vary depending on the levels of credit stability and competitiveness observed within the sector and for individual borrowers.

Nutrient Reduction in NYC: Long Island Sound Study and CSO Consent Order

The New York City Department of Environmental Protection (NYCDEP) has actively addressed nutrient reduction from a number of sources over the past three decades. In 1985, the Long Island Sound Study (LISS), which was created by the USEPA and New York State Department of Environmental Conservation (NYSDEC) provided guidelines for how to improve poor water quality in the Long Island Sound. The LISS concluded that the leading cause of the LIS’s degraded condition was hypoxia, primarily linked to an overabundance of nitrogen. The greatest sources of nitrogen were attributed to municipal and industrial WWTPs, CSOs, and nonpoint and atmospheric depositions.\(^5\)

The New York City Department of Environmental Protection, which operates four Upper East River/LIS WWTPs, was required by the NYSDEC to implement nutrient reduction programs at these plants. In May 2014, NYCDEP announced the completion of a $290 million nutrient-related upgrade at the Tallman Island WWTP in College Point, Queens. Overall, NYCDEP estimates that it has invested more than $1.5 billion in similar nitrogen reduction upgrades elsewhere over the last 10 years, and that these improvements have resulted in a reduction of more than 3.5 million pounds of nitrogen per day (nearly 1.3 million pounds each year). The NYCDEP projects that it will continue to reduce excessive nitrogen discharges from these plants by nearly 60 percent by 2017.\(^5\)
In addition to implementing nutrient reduction programs at its WWTPs, NYCDEP entered into an order of consent in 2005 with the USEPA and NYSDEC to address CSOs. The agency’s most recently updated Long Term Control Plan outlines a hybrid approach of using both green and gray infrastructure to capture, contain and treat excess precipitation that would otherwise overwhelm the combined sewer network. Over the next 10 years, NYCDEP has budgeted over $1.1 billion towards the implementation of this combined green/gray plan.6

The NYCDEP is one of the largest environmental protection agencies in the United States and frequently accesses the municipal bond market to fund its multi-billion five-year CIP, including the projects mentioned above. The New York City Municipal Water Finance Authority (NYW) is the entity responsible for issuing debt on behalf of the NYCDEP and is currently rated AA+ by Fitch. Similar to many large urban utility systems, NYW’s capital needs are significant, principally the result of state and federally mandated projects. The capital program for fiscal years 2014-2023 includes an estimated $13.4 billion in water and sewer projects, funding for which will continue to come almost entirely from long-term debt issuance. As of June 2014, NYW’s forecast shows additional bond issues through fiscal 2018 totaling $5.5 billion, or an annual average of approximately $1.4 billion. Debt levels are high and escalation beyond what is currently forecast could pressure NYW’s rating over the medium term. Total outstanding debt to net plant assets now stands at about 100 percent, indicating that the utility has just as much debt outstanding as its entire system asset base is worth. Also, leverage as measured on a per capita basis, approximates $3,000. By comparison, Fitch’s AA category median ratios for debt to net plant and debt per capita are 49 percent and $492, respectively.5 Fitch believes that NYW’s highly levered position and extensive capital needs, both mandated and otherwise, are mitigated in part by the system’s demonstrated commitment to raising rates as well as the system’s strong financial management. These factors will be key to preserving operating margins and meeting the continued growth in debt service costs included in NYW’s current financial forecast. Other credit attributes include sound legal covenants, the essentiality of the service, and the strong and diverse economic status of the service territory.

Nutrient Reduction in Chesapeake Bay: Hampton Roads Sanitation District

The Hampton Roads Sanitation District (HRSD/ the district) in the Hampton Roads region of Virginia (which holds wastewater revenue bonds rated AA+/AA on senior/subordinate liens), is currently assessing a massive strategy to reduce nutrient loading from CSOs into and around the ecologically sensitive and heavily protected Chesapeake Bay. In 2007, the district, together with 13 of the municipalities it serves (the localities) entered into a regional consent decree with the state of Virginia (and the federal government in 2009) to reduce SSOs in the Hampton Roads region. In 2010, the district and the localities developed a regional wet weather management plan (RWMP) to collectively address the SSO violations and the district’s strategy is still under consideration.

During fiscal 2013, HRSD’s outstanding debt totaled approximately $799 million. Debt to net capital assets was an above average 82 percent in that year, but at $1,738 debt per customer remains just below the median for AA category water and sewer utilities. Debt carrying costs are also on the rise, but still comprise a manageable 24 percent of fiscal 2013 gross revenues. The district’s $500 million five-year capital plan is expected to be roughly 50 percent debt-funded through fiscal 2018, yet the system’s pro forma debt burden is projected to increase only modestly with key ratios remaining close to the AA rate medians.

Longer-term capital needs remain significant; the HRSD’s 10-year, $1.14 billion CIP will address regulatory requirements associated with nutrient reduction standards and SSOs, as well as fund system-wide renewal and rehabilitation of aging infrastructure. The HRSD anticipates it will issue additional bonds totaling approximately $350 million between fiscal 2019-2023 primarily to offset the costs associated with the consent order projects. Another roughly $800 million in projected debt will be issued thereafter, as the 20-year CIP is closer to $3 billion. Fitch is concerned that the significantly higher longer-term projected debt needs will lead to a significantly higher future debt profile.

Fitch believes these concerns are currently mitigated by the extended time horizon for project implementation, HRSD’s role as a large and important regional wastewater service provider with broad powers and authority, and a proven proactive and diligent management team. Fitch will continue to monitor capital spending needs and other related developments regarding the implementation of the RWMP, including potential regionalization, as they progress.

As demonstrated by these examples, regulatory enforcement does not implicitly lead to immediate rating action. The existence of weaker credit quality may render a utility more vulnerable to mandated nutrient reduction programs if elevated debt loads and capital needs lead to deteriorated financial positions and unaffordable customer charges. There are many examples of utilities and communities around the country that are ill equipped to implement the requirements of a consent order in addition to meeting existing needs. These entities would benefit greatly from replicating the qualities observed in more highly rated credits, including: proactively anticipating the capital implications of upcoming regulatory changes; incrementally and consistently addressing structural deficiencies that may assist with or even preclude eventual large capital projects; and strategically planning funding options and rate increases needed to repay debt. A strong operational and financial management team will not only achieve the aforementioned goals, but also transparently engage with the customer base in order to successfully implement necessary rate increases.

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References